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Boeing Realty Corporation
3760 Kilroy Airport Way, Suite 500
Long Beach, CA 90806
Telephone: 562-627-4900
FAX: 562-627-4906

27 July 2001
C6-BRC-T-01-015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013


Attention: John Geroch

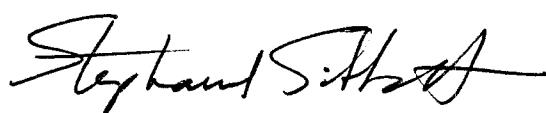
Subject: **STOCKPILE PLACEMENT/DISPOSITION EVALUATION FOR
BOEING REALTY CORPORATION, FORMER C-6 FACILITY,
19503 SOUTH NORMANDIE AVENUE, LOS ANGELES, CA**

Dear Mr. Geroch:

Please find enclosed for your review, a copy of the subject document prepared by Haley & Aldrich, Inc. for Boeing Realty Corporation.

If you have any questions concerning this document, please contact the undersigned at 562-593-8623.

Sincerely,



Stephanie Sibbett
Boeing Realty Corporation

Cc: Mario Stavale, Boeing Realty Corporation
Scott Lattimore, Long Beach Division

enclosure

**BOEING REALTY CORPORATION
FORMER C-6 FACILITY
LOS ANGELES, CALIFORNIA**

TECHNICAL MEMORANDUM

**STOCKPILE PLACEMENT/DISPOSITION EVALUATION
STOCKPILES SP-1 THROUGH SP-11**

To: Mr. Brian Mossman
Boeing Realty Corporation
3855 Lakewood Blvd.
Building 1A MC D001-0097
Long Beach, CA 90846

From: Haley & Aldrich, Inc.

Date: July 19, 2001

Re: Stockpile Placement/Disposition Evaluation, Boeing Realty Corporation, Former C-6 Facility – Parcel C, Los Angeles, California

Haley & Aldrich, Inc. is herein providing this technical memorandum to summarize our recommendations regarding the onsite placement and offsite transport of temporarily stockpiled excavated materials at Parcel C of the Boeing Realty Corporation's (BRC's) Former C-6 Facility in Los Angeles, California (subject parcel).

OVERVIEW/PURPOSE

Potentially impacted materials identified during demolition monitoring activities have been excavated to expedite potential onsite remediation activities, thus, reducing the potential for affecting the current redevelopment schedule at the subject parcel. These materials were segregated by the location from which they were excavated and by known or suspected chemical impacts. Representative samples collected from these materials were evaluated using human health risk assessment procedures to determine which of the temporary soil stockpiles could be reused onsite and which should be transported offsite to regulated treatment/disposal facilities. The evaluation methodology and the onsite placement/offsite transport recommendations are presented herein.

IDENTIFICATION OF STOCKPILED SOIL

Materials, comprised primarily of soils, were identified for excavation based on field observations and the results of in-situ samples collected and analyzed following the Los Angeles Regional Water Quality Control Board (LARWQCB)-approved sampling and analysis plan for the subject parcel and the subsequent LARWQCB-approved addendum and supplements.

Eleven temporary stockpiles (SP-1 through SP-11) were generated from onsite excavations at the subject parcel. Each of these stockpiles is comprised of soil, with the exception of stockpile SP-6, which is comprised concrete. Stockpile SP-10 was divided into 44 segregated stockpile segments. Each of the stockpiles SP-1 through SP-9, and SP-11 contain between 20 and 1,500 cubic yards of soil. Each segment of stockpile SP-10 contains approximately 115 cubic yards of soil.

STOCKPILE CHARACTERIZATION METHODOLOGY

Soil samples obtained from each of the apparently impacted areas from which stockpiles SP-1 through SP-5, SP-7 through SP-9, and SP-11 were generated were used to characterize the associated stockpiled soil. In addition, a soil sample was later obtained from stockpile SP-1 and tested for polynuclear aromatic hydrocarbons (PAHs). It is assumed that these samples represent the maximum concentrations of chemicals detected in their respective stockpile. A representative concrete sample was obtained from stockpile SP-6, and a randomly collected soil sample was obtained from the approximate center of each of the 44 stockpile SP-10 segments. Each of the representative samples for stockpiles SP-1 through SP-11 was tested for suspected chemical constituents following the protocols presented in the LARWQCB-approved sampling and analysis plan for the subject parcel and the subsequent LARWQCB-approved addendum and supplements.

STOCKPILE EVALUATION METHODOLOGY

The stockpile sample results were evaluated using screening human health risk assessment procedures as described in the November 29, 2000 Risk Assessment Work Plan (RAWP) for the subject parcel following the decision process summarized in Figure 1. In addition, maximum volatile organic compound (VOC) concentrations for each stockpile or stockpile segment were evaluated to assess whether VOC concentrations in the stockpiles have the potential to degrade existing groundwater quality.

Human Health Risk Evaluation

The maximum concentrations detected in each stockpile were separately added to the maximum concentrations detected within each of three areas of subject parcel. These three areas of the subject parcel are identified as the Building 1 Exposure Area, the Building 2 Exposure Area, and the Parcel C Exposure Area (Figure 2). The Building 1 and 2 Exposure Areas are defined by two areas of elevated VOC impacts at and in proximity to former Buildings 1 and 2, respectively. The remaining portion of the subject parcel (Parcel C Exposure Area) contains relatively lower chemical concentrations and/or smaller impacted areas. The risk assessment results for each area were then compared to the LARWQCB- and Office of Environmental Health Hazard Assessment (OEHHHA)-approved target risk levels.

Groundwater Protection Evaluation

Even though shallow groundwater beneath and in proximity to the subject parcel is not used as a domestic water supply, the evaluation conservatively assumed potential downward chemical migration from soil resulting in possible degradation of the Bellflower aquitard to levels greater than

the California drinking water standards (i.e. Maximum Contaminant Levels [MCLs]). The assessment was conducted assuming a conservative scenario regarding chemical migration and mixing in groundwater following approved EPA and LARWQCB methodology and assumptions. This evaluation was conducted by comparing maximum VOC concentrations to site-specific soil screening levels (SSLs) derived from primary MCLs.

Initial site-specific SSLs were derived using the formula presented in Section 2.5 of the EPA document entitled *Soil Screening Guidance: Technical Background Document (TBD)*, dated July 1996, and site-specific geotechnical parameters. The EPA SSL equation is a partitioning formula, which does not account for chemical attenuation during migration in soil or mixing with groundwater. To better represent contaminant migration in the soil column, an attenuation factor of 13 was applied to the initial SSL. This attenuation factor was obtained from Table 5-14 of the LARWQCB's May 1996 *Interim Site Assessment & Cleanup Guidebook*, assuming site-specific average soil particle size distributions, and a distance of 53 feet from soil impacts to the groundwater table (i.e., stockpiled material to be placed onsite at a maximum depth of 12 feet below ground surface (bgs) or shallower, and the water table is located at a depth of 65 feet bgs). An EPA default dilution attenuation factor (DAF) of 20 was also applied to the initial SSL to account for limited groundwater mixing. This EPA default value is presented in the above-referenced July 1996 EPA document, and was used by EPA to develop generic SSLs. The resulting site-specific SSL is, thus, equal to the initial SSL (assuming no soil attenuation or groundwater mixing) multiplied by the product of a soil attenuation factor of 13 and a groundwater mixing factor of 20.

RECOMMENDATIONS

The recommendation for onsite reuse of each stockpile is based on whether the target risk levels of the area of the subject parcel are exceeded after addition of the maximum concentrations detected in that stockpile and on whether maximum VOC concentrations may degrade groundwater quality to concentrations greater than MCLs. If the estimated risk remains below the target risk levels for that area of the subject parcel and VOC concentrations would not degrade groundwater quality to concentrations greater than MCLs, it is recommended that the stockpile be reused in that area of the subject parcel. If the estimated risk is greater than a target risk level or if VOC concentrations may degrade groundwater quality to concentrations greater than MCLs, it is recommended that the stockpile be transported offsite at a regulated treatment/disposal facility.

A summary of the recommendations for the stockpiles is presented in Tables 1 and 2. The laboratory data for the stockpile samples is presented in Appendix A, and the SSL calculations are presented in Appendix B.

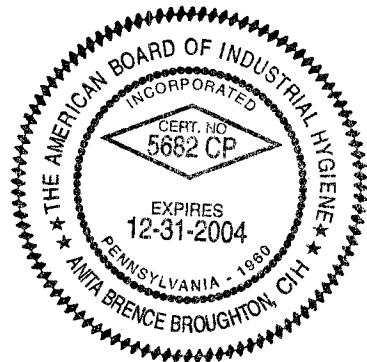
Should you have any questions concerning the contents of this memorandum or require additional information, please contact either of the undersigned.

Sincerely yours,
HALEY & ALDRICH, INC.



Anita Broughton, REA, CIH
Risk Assessment Task Manager

Richard M. Farson, PE
Senior Engineer



Attachments:

- Figure 1 Soil Stockpile Reuse Protocol
- Figure 2 Parcel C Exposure Areas
- Table 1 Recommendations for Stockpiles SP-1 through SP-9, and SP-11
- Table 2 Recommendations for Stockpile SP-10
- Appendix A Compact Disc of Laboratory Reports
- Appendix B Soil Screening Level (SSL) Calculations

Table 1
Recommendations for Stockpiles SP-1 through SP-9, and SP-11
BRC Former C-6 Facility, Los Angeles, California

Stockpile No.	Sample IDs	Approx. Volume	Analyses	Acceptable for Onsite Reuse? (Yes or No)	Restrictions on Parcel C Placement?	Recommendations
SP-1	Build-1-A-4-120100-2, Build-1-A-4-12900-1, Build-1-D-3-120400-1, Build-1-J-4-121500-1, Build-1-J-4-121500-2, Build-1-J-4-121500-3	~ 700 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse. TPH concentrations are less than 100 mg/kg, and addition of parameter concentrations result in health risk below target risk levels; however, elevated xylene results pose a potential threat to groundwater quality at levels greater than the MCL.
SP-2	Build-2-AK-13-021901-1	~ 500 cy	TPH, PCBs, PAHs, SVOCs, VOCs, Metals	Yes	Not acceptable for placement in Building 2 Area	Acceptable for reuse in Parcel C with exception of Building 2 Area. Addition of parameter concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP-3	Build-2-AK-17-021501-1, Build-2-AK-17-032701-2	~ 800 cy	TPH, PCBs, PAHs, SVOCs, VOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP-4	Build-20-M-23-032101-1, Build-20-L-23-032101-2, Build-20-M-23-032201-7	~ 400 cy	TPH, PCBs, PAHs, SVOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP-5	Source_SP_5_041601_1 through 6	~ 1,500 cy	PCBs, PAHs, Metals	Yes	Not acceptable for placement in Building 1 and 2 Areas	Acceptable for reuse in Parcel C outside of the Building 1 and 2 Areas. Addition of parameter concentrations result in health risk below target risk levels.
SP-6		NA (concrete)	Metals	No	NA	Not acceptable for onsite reuse due to elevated metals results. Treat/dispose of offsite at a regulated facility.
SP-7	Build-2-V-14-042501-1	~ 200 cy	TPH, PCBs, PAHs, SVOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated PCB results. Treat/dispose of offsite at a regulated facility.

Table 1
Recommendations for Stockpiles SP-1 through SP-9, and SP-11
BRCC Former C-6 Facility, Los Angeles, California

SP-8	Build-2-AD-14-042601-1	~ 200 cy	TPH, PCBs, PAHs, SVOCs, VOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP-9	Build-2-AN-23-051001-1, Build-2-AN-20-051001-1, Build-2-AN-19-051001-1	~ 700 cy	TPH, PCBs, PAHs, SVOCs, VOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated arsenic results. Treat/dispose of offsite at a regulated facility.
SP-11	Build-1M-10-053101-8	~ 20 cy	TPH, PCBs, PAHs, SVOCs, VOCs, Metals	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.

NA = Not Applicable
PAH risk drivers include benzo(a)pyrene and dibenzo(a,h)anthracene.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

Stockpile No./ Sample ID	Approx. Volume	Analyses	Acceptable for Onsite Reuse? (Yes or No)	Restrictions on Parcel C Placement?	Rationale
SP10A-1	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. Addition of parameters concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10A-2	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10A-3	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP10A-4	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP10A-5	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10A-6	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10A-7	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. Addition of parameters concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

SP10A-8	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. Addition of parameters concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10A-9	~ 115 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10A-10	~ 115 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10A-11	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10A-12	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. Addition of parameters concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10A-13	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10A-14	~ 115 cy	TPH, VOCs	Yes		Acceptable for reuse in portions of Parcel C outside of the Building 2 Area. Sample from this stockpile segment not tested for PAHs; however, results of sample SP10B-40 with the same TPH concentration contained PAH concentrations resulting in health risk below target risk levels. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP10A-15	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

SP-10A-16	~ 115 cy TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. Addition of parameters concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP-10A-17	~ 115 cy TPH, VOCs	Yes	Not acceptable for placement in Building 2 Area	Acceptable for reuse in portions of Parcel C outside of the Building 2 Area. Sample from this stockpile segment not tested for PAHs; however, results of sample SP10B-40 with a higher TPH concentration contained PAH concentrations resulting in health risk below target risk levels. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP-10A-18	~ 115 cy TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP-10A-19	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP-10A-20	~ 115 cy TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP-10A-21	~ 115 cy TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP-10A-22	~ 115 cy TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP-10B-23	~ 115 cy PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP-10B-24	~ 115 cy TPH VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

SP10B-25	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-26	~ 115 cy PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10B-27	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-28	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentration contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-29	~ 115 cy PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10B-30	~ 115 cy TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10B-31	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-32	~ 115 cy TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-33	~ 115 cy PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

SP10B-34	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-35	~ 115 cy	TPH, VOCs	Yes	Not acceptable for placement in Building 2 Area	Acceptable for reuse in portions of Parcel C outside of the Building 2 Area. Sample from this stockpile segment not tested for PAHs; however, results of sample SP10B-40 with a higher TPH concentration contained PAH concentrations resulting in health risk below target risk levels. Addition of VOC concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10B-36	~ 115 cy	TPH, VOCs	Yes	Not acceptable for placement in Building 2 Area	Acceptable for reuse in portions of Parcel C outside of the Building 2 Area. Sample from this stockpile segment not tested for PAHs; however, results of sample SP10B-40 with a higher TPH concentration contained PAH concentrations resulting in health risk below target risk levels. Addition of VOC concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10B-37	~ 115 cy	TPH, VOCs, PAHs	Yes	Not acceptable for placement in Building 1 and 2 Areas	Acceptable for reuse in the portion of Parcel C outside of the Building 1 and 2 Areas. Addition of VOC and PAH concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10B-38	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.
SP10B-39	~ 115 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10B-40	~ 115 cy	TPH, VOCs, TPH, VOCs, PAHs	Yes	Not acceptable for placement in Building 2 Area	Acceptable for reuse in portions of Parcel C outside of the Building 2 Area. Addition of VOC and PAH concentrations result in health risk below target risk levels, and detected VOCs do not pose a threat to groundwater quality at levels greater than MCLs.
SP10B-41	~ 115 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.

Table 2
Recommendations for Stockpile SP-10
BRC Former C-6 Facility, Los Angeles, California

SP10B-42	~ 115 cy	TPH, VOCs, PAHs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Treat/dispose of offsite at a regulated facility.
SP10B-43	~ 115 cy	TPH, VOCs	Yes	None	Acceptable for reuse in any portion of Parcel C. TPH concentrations are less than 100 mg/kg. VOCs are less than the laboratory detection limits, and thus, do not pose a health risk above target risk levels nor a threat to groundwater quality at levels greater than MCLs.
SP10B-44	~ 115 cy	TPH, VOCs	No	NA	Not acceptable for onsite reuse due to elevated PAH results. Sample from this stockpile segment not tested for PAHs; however, results of other samples from this stockpile with similar TPH concentrations contained PAH that resulted in estimated health risks above target risk levels. Treat/dispose of offsite at a regulated facility.

NA = Not Applicable

PAH risk drivers include benzo(a)pyrene and dibenzo(a,h)anthracene.

Appendix A

APPENDIX A

LABORATORY REPORTS

C-6 Stockpiles SP1 - SP11
Lab data

DISC
COMPACT
RECORDABLE

Appendix B

APPENDIX B

SOIL SCREENING LEVEL (SSL) CALCULATIONS

Site-specific Soil screening Levels (SSLs) Assuming Impacts at Depths of 12 Feet bgs

CAS No.	Chemical	MCL (mg/L)	K _{oc} ^(1,2)	f _{oc} ⁽³⁾	K _d ⁽⁴⁾	H ⁽¹⁾	O _w ⁽³⁾	O _a ⁽³⁾	P _b ⁽³⁾	A _{F_T}	Site-specific SSL (mg/kg) at A _{F_T} = 1	Site-specific SSL (mg/kg) at D=53' x DAF
100-41-4	Ethylbenzene	7.00E-01	2.0E+02	5.19E-04	--	3.2E-01	2.53E-01	2.07E-01	1.44E+00	13	2.28E-01	6.12E+01
108-88-3	Toluene	1.50E-01	1.4E+02	5.19E-04	--	2.7E-01	2.53E-01	2.07E-01	1.44E+00	13	4.30E-02	1.16E+01
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	2.00E-01	1.4E+02	5.19E-04	--	7.1E-01	2.63E-01	2.07E-01	1.44E+00	13	7.01E-02	1.88E+01
79-01-6	Trichloroethylene	5.00E-03	9.4E-01	5.19E-04	--	4.2E-01	2.53E-01	2.07E-01	1.44E+00	13	1.42E-03	3.82E-01
1330-20-7	Xylene (total)	1.75E+00	2.0E+02	5.19E-04	--	3.0E-01	2.53E-01	2.07E-01	1.44E+00	13	5.64E-01	1.52E+02

Notes:

An SSL was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential for groundwater degradation at concentrations greater than MCLs.

Initial SSL derived using EPA July 1996 Soil Screening Guidance: Technical Background Document, where $SSL = MCL \times f_{oc} + (O_w + O_a H^+ / P_b)$. AF_{T_{wg}} calculated from LARWQCB May 1986 Interim Site Assessment and Cleanup Guidebook which accounts for attenuation in the soil assuming site-specific soil particle distribution and distance between impacts and groundwater table of 53 feet, and default DAF for EPA SSLs of 20 as presented in EPA July 1996 Soil Screening Guidance: Technical Background Document which accounts for limited groundwater mixing.

AF_{T_{wg}} = Average attenuation factor based on site lithology (distance to groundwater = 53 feet, 30% sand, 57% silt, and 13% clay).

na = not available

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil/water partition coefficient (L/kg), K_{oc} × f_{oc}

H = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

P_b = dry soil bulk density (kg/L)

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.sdr.nlm.nih.gov/cgi-bin/tox/TOX_select?select=csf

⁽³⁾ Site-specific average values

⁽⁴⁾ Obtained from EPA Soil Screening Guidance: Technical Background Document (TBD), EPA/540/R-95/128, July 1996, <http://www.epa.gov/oerrpage/superfund/resources/soil/toc.htm>

Geotechnical Parameters for the BRC Former C-6 Facility, Los Angeles, California

Sample ID	Date Sampled	Depth (feet bgs)	Sieve Analysis (Soil Type)	Dry Bulk Density (kg/L)	Moisture Content (percent by weight)	Total Porosity (fraction by volume)	Air-filled Porosity (fraction by volume)	Water-filled Porosity (fraction by volume)	TOC* (mg/kg)	f_{oc} (fraction by weight)
EIA290176-001 (I-34-5)	1/29/2001	5	Silt	1.51	15.9	0.43	0.19	0.24	520	0.0005
EIA290176-010 (D-29-5)	1/29/2001	5	Silt	1.44	20.3	0.46	0.16	0.29	2350	0.0024
EIA290176-018 (I-25-5)	1/29/2001	5	Silt	1.34	17.8	0.49	0.26	0.24	690	0.0007
Average				1.43	18.0	0.46	0.20	0.26	1187	0.0012
EIA290176-004 (I-34-20)	1/29/2001	20	Silt	1.54	17.5	0.42	0.15	0.27	330	0.0003
EIA290176-012 (D-29-20)	1/29/2001	20	Silt	1.55	17.0	0.41	0.15	0.26	430	0.0004
EIA290176-021 (I-25-20)	1/29/2001	20	Silt	1.37	20.2	0.48	0.20	0.28	410	0.0004
Average				1.49	18.2	0.44	0.17	0.27	390	0.0004
EIA290176-007 (I-34-50)	1/29/2001	50	Fine sand	1.35	4.4	0.51	0.45	0.06	230	0.0002
EIA290176-015 (D-29-50)	1/29/2001	50	Fine sand	1.36	19.5	0.49	0.22	0.26	560	0.0006
EIA290176-024 (I-25-50)	1/29/2001	50	Silt	1.34	24.3	0.51	0.18	0.32	470	0.0005
Average				1.35	16.1	0.50	0.28	0.22	420	0.0004
Weighted Fraction by weight (depths 12 to 65 feet bgs)										
1.44										
0.46										
0.21										
0.25										
0.0005										

The weighted fraction by weight assumes the 5-foot sample is representative of the top 20 feet, the 20-foot sample of depths between 20 and 50 feet, and the 50-foot sample of depths between 50 and 65 feet bgs.

Notes:

The laboratory report will be provided as an appendix of the Soil Assessment Report which is being prepared by Kennedy/Jenks, Inc. and will be submitted to the RWQCB under separate cover.

The air-filled porosity values were calculated from gravimetric data, not volumetric data.

* f_{oc} = the weight fraction of organic carbon in soil = TOC/1,000,000

Soil Particle Size Distribution for the BRC Former C-6 Facility, Los Angeles, California

Sample ID	Date Sampled	Depth (feet bgs)	Sieve Analysis (Soil Type)	Median Grain Size (mm)	Particle Size Distribution, wt. Percent					
					Gravel	Coarse	Medium	Fine	Total	Silt
EIA290176-001 (I-34-5)	1/29/2001	5	Silt	0.029	0.00	0.22	17.60	17.82	69.80	12.37
EIA290176-010 (D-29-5)	1/29/2001	5	Silt	0.027	0.00	0.02	17.00	17.02	68.41	14.58
EIA29176-018 (I-25-5)	1/29/2001	5	Silt	0.026	0.00	0.39	14.86	15.25	68.78	15.97
Average								16.70	69.00	14.31
EIA290176-004 (I-34-20)	1/29/2001	20	Silt	0.032	0.00	0.00	0.00	31.19	31.19	54.83
EIA290176-012 (D-29-20)	1/29/2001	20	Silt	0.036	0.00	0.90	27.59	28.49	59.67	11.85
EIA29176-021 (I-25-20)	1/29/2001	20	Silt	0.020	0.00	0.00	11.21	11.21	69.07	19.72
Average								23.63	61.19	15.19
EIA290176-007 (I-34-50)	1/29/2001	50	Fine sand	0.151	0.00	0.00	0.57	79.33	79.90	17.39
EIA29176-015 (D-29-50)	1/29/2001	50	Fine sand	0.083	0.00	0.26	47.93	51.19	39.79	9.01
EIA29176-024 (I-25-50)	1/29/2001	50	Silt	0.027	0.00	0.04	21.27	21.31	64.99	13.70
Average								50.80	40.72	8.47

Weighted Fraction by weight (depths 12 to 65 feet bgs)

0.30	0.57	0.13
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The weighted fraction by weight assumes the 5-foot sample is representative of the top 20 feet, the 20-foot sample of depths between 20 and 50 feet, and the 50-foot sample of depths between 50 and 65 feet bgs.

Appendix B

APPENDIX B

SOIL SCREENING LEVEL (SSL) CALCULATIONS

Site-specific Soil screening Levels (SSLs) Assuming Impacts at Depths of 12 Feet bgs

CAS No.	Chemical	MCL (mg/L)	$K_{oc}^{(1,2)}$	$f_{oc}^{(3)}$	$K_d^{(4)}$	$H^{(1)}$	$O_w^{(3)}$	$O_a^{(3)}$	$P_b^{(3)}$	AF_T	Site-specific SSL (mg/kg) at $AF_T = 1$	Site-specific SSL (mg/kg) at AF_T at D=53' x DAF
100-41-4	Ethylbenzene	7.00E-01	2.0E+02	5.19E-04	--	3.2E-01	2.53E-01	2.07E-01	1.44E+00	13	2.28E-01	6.12E+01
108-88-3	Toluene	1.50E-01	1.4E+02	5.19E-04	--	2.7E-01	2.53E-01	2.07E-01	1.44E+00	13	4.30E-02	1.16E+01
71-55-6	1,1,1-Trichloroethane (1,1,1-TCA)	2.00E-01	1.4E+02	5.19E-04	--	7.1E-01	2.53E-01	2.07E-01	1.44E+00	13	7.01E-02	1.88E+01
79-01-6	Trichloroethylene	5.00E-03	9.4E+01	5.19E-04	--	4.2E-01	2.53E-01	2.07E-01	1.44E+00	13	1.42E-03	3.82E+01
1330-20-7	Xylene (total)	1.75E+00	2.0E+02	5.19E-04	--	3.0E-01	2.53E-01	2.07E-01	1.44E+00	13	5.64E-01	1.54E+02

Notes:

An SSL was not derived for chemicals that do not have promulgated primary MCLs. These chemicals were not included in the assessment of potential for groundwater degradation at concentrations greater than MCLs.

Initial SSL derived using EPA July 1996 Soil Screening Guidance: Technical Background Document, where $SSL = MCL (K_{oc} * f_{oc} + (O_w + O_a)H/P_b)$. $AF_{T,wg}$ calculated from LARWQCB May 1986 Interim Site Assessment and Cleanup Guidebook which accounts for attenuation in the soil assuming site-specific soil particle distribution and distance between impacts and groundwater table of 53 feet, and default DAF for EPA SSLs of 20 as presented in EPA July 1986 Soil Screening Guidance: Technical Background Document which accounts for limited groundwater mixing.

$AF_T =$ Average attenuation factor based on site lithology (distance to groundwater = 53 feet, 30% sand, 57% silt, and 13% clay).

na = not available

K_{oc} = soil organic carbon-water partition coefficient (L/kg)

f_{oc} = site-specific organic carbon content of soil (kg/kg)

K_d = soil-water partition coefficient (L/kg), $K_{oc} \times f_{oc}$

H = dimensionless Henry's law constant

O_w = site-specific average water-filled porosity (by volume)

O_a = site-specific average air-filled porosity (by volume)

P_b = dry soil bulk density (kg/L)

⁽¹⁾ Obtained from EPA Region 9 preliminary remediation goal (PRG) physical-chemical data for volatile organic compounds, November 2000

⁽²⁾ Obtained from Risk Assessment Information System (RAIS) Toxicity & Chemical-Specific Factors Data Base, January 2001, http://risk.lsc.ornl.gov/cgi-bin/tox/TOX_select?select=csf

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